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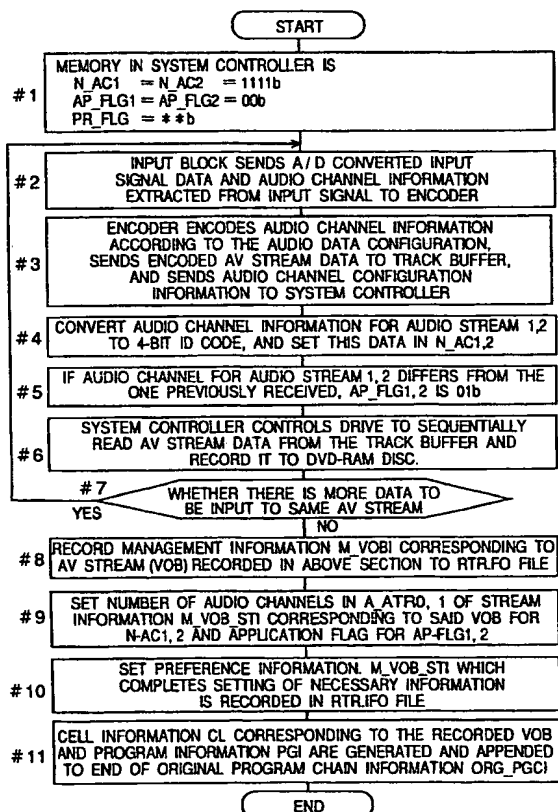
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(54) Title: OPTICAL DISC, RECORDING DEVICE AND REPRODUCING DEVICE



(57) Abstract: Optical discs formatted to record plural audio streams of different content for reproduction with a single video stream can result in audio output of content unexpected by the user depending upon the audio stream configuration contained in the AV stream reproduced. This can confuse and cause the user to change the audio output after reproduction starts. To prevent this, information indicating the type of audio stream configuration contained in each AV stream on the optical disc is stored with each audio stream. This audio stream type information is presented to the user on the same screen from which an AV program is selected for playback. The user can thus know before playback starts what audio stream channel is preselected for playback, and can change the audio channel as desired before playback starts.

WO 00/60597 A1



*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

**AMENDED CLAIMS**

[received by the International Bureau on 3 October 2000 (03.10.00);  
original claims 1-7 replaced by new claims 1-10 (7 pages)]

1. An optical disc comprising:

an area for storing an AV stream containing an encoded  
5 video stream and at least one encoded audio stream, and

an area for storing management information,

said management information comprising an  
application flag which indicates whether a single audio stream  
includes at least two of the following, and

10 (a) dual monaural audio data having first  
audio channel data and second audio channel data, one of  
which is selectively reproduced,

(b) stereo audio data having first audio  
channel data and second audio channel data, which are  
15 simultaneously reproduced, and

(c) monaural audio data having data for  
only one audio channel.

2. An optical disc as claimed in claim 1, wherein said  
20 management information further comprising, when the single  
audio stream contains at least two of said audio data (a), (b)  
and (c), data indicating which one of the at least two audio  
data (a), (b) and (c) is a representative audio data.

3. A recording method for recording an optical disc comprising an area for storing an AV stream containing an encoded video stream and at least one encoded audio stream,  
5 and an area for storing management information, said recording method comprising:

detecting whether a single audio stream comprises at least two of the following,

(a) dual monaural audio data having first  
10 audio channel data and second audio channel data, one of which is selectively reproduced,

(b) stereo audio data having first audio channel data and second audio channel data, which are simultaneously reproduced, and

15 (c) monaural audio data having data for only one audio channel; and

recording an application flag to the area for storing management information according to the detection result.

20

4. A recording method as claimed in claim 3, further comprising:

determining a representative audio data when the

single audio stream contains at least two of said audio data (a), (b) and (c); and

recording the representative audio data to said area for storing management information.

5

5. A recording apparatus for recording an optical disc comprising an area for storing an AV stream containing an encoded video stream and at least one encoded audio stream, and an area for storing management information, said  
10 recording apparatus comprising:

detection means for detecting whether a single audio stream comprises at least two of the following,

(a) dual monaural audio data having first audio channel data and second audio channel data, one of  
15 which is selectively reproduced,

(b) stereo audio data having first audio channel data and second audio channel data, which are simultaneously reproduced, and

(c) monaural audio data having data for  
20 only one audio channel; and

recording means for recording an application flag to the area for storing management information according to the detection result.

6. A recording apparatus as claimed in claim 5, further comprising:

means for determining a representative audio data  
5 when the single audio stream contains at least two of said audio data (a), (b) and (c); and

recording means for recording the representative audio data to said area for storing management information.

10 7. A playback method for reproducing an optical disc comprising an area for storing an AV stream containing an encoded video stream and at least one encoded audio stream, and an area for storing management information, said management information comprising an application flag which  
15 indicates whether a single audio stream includes at least two of the following,

(a) dual monaural audio data having first audio channel data and second audio channel data, one of which is selectively reproduced,

20 (b) stereo audio data having first audio channel data and second audio channel data, which are simultaneously reproduced, and

(c) monaural audio data having data for

only one audio channel;

the playback method comprising:

reading the application flag from the area for storing management information;

5                    detecting according to the application flag whether the single audio stream contains at least two of said audio data (a), (b) and (c).

8.                    A playback method as claimed in claim 7,  
10                    wherein said management information further comprising, when the single audio stream contains at least two of said audio data (a), (b) and (c), data indicating which one of the at least two audio data (a), (b) and (c) is a representative audio data, and

15                    said playback method further comprising reading from the area for storing management information, when the single audio stream contains at least two of said audio data (a), (b) and (c), the data indicating which one of the at least two audio data (a), (b) and (c) is the representative audio data.

20

9.                    A playback apparatus for reproducing an optical disc comprising an area for storing an AV stream containing an encoded video stream and at least one encoded audio stream,

and an area for storing management information, said management information comprising an application flag which indicates whether a single audio stream includes at least two of the following,

5 (a) dual monaural audio data having first audio channel data and second audio channel data, one of which is selectively reproduced,

(b) stereo audio data having first audio channel data and second audio channel data, which are  
10 simultaneously reproduced, and

(c) monaural audio data having data for only one audio channel;

the playback apparatus comprising:

means for reading the application flag from the  
15 area for storing management information;

means for detecting according to the application flag whether the single audio stream contains at least two of said audio data (a), (b) and (c).

20 10. A playback apparatus as claimed in claim 9, wherein said management information further comprising, when the single audio stream contains at least two of said audio data (a), (b) and (c), data indicating which one of



the at least two audio data (a), (b) and (c) is a representative audio data, and

said playback apparatus further comprising means for reading from the area for storing management information, 5 when the single audio stream contains at least two of said audio data (a), (b) and (c), the data indicating which one of the at least two audio data (a), (b) and (c) is the representative audio data.

## STATEMENT UNDER ARTICLE 19

The claims are amended according to the corresponding EP  
5 application as explained below.

The present PCT application does not have EPC as one of  
the designated states, because the EP application (No. 00 106  
798.2-2210) has been filed separately.

Claim 1 relates to an optical disc in accordance with the  
10 present invention. One feature of the present invention recited in  
claim 1 is in that:

“management information comprising an application flag  
which indicates whether a single audio stream includes at  
least two of the following, (a) dual monaural audio data  
15 having first audio channel data and second audio channel  
data, one of which is selectively reproduced, (b) stereo  
audio data having first audio channel data and second  
audio channel data, which are simultaneously reproduced,  
and (c) monaural audio data having data for only one audio  
20 channel.”

The above feature is disclosed on page 39, line 12 and lines  
14-18 of the original specification.

One of advantages of claim 1 in accordance with the present  
invention is to avoid the user from being confused when playback  
25 actually begins.

Claim 3 relates to a recording method, and corresponds to

claim 1.

Claim 5 relates to a recording apparatus, and corresponds to claim 1.

Claim 7 relates to a playback method, and corresponds to  
5 claim 1.

Claim 9 relates to a playback apparatus, and corresponds to claim 1.

Claims 2, 4, 6, 8 and 10 relates to data indicating which one of the at least two audio data (a), (b) and (c) is a representative  
10 audio data. This is disclosed in the specification on page 43, lines 1-10.